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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,955	12/18/2001	Roger Bernards	12329US02	6069

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EXAMINER
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AHMED, SHAMIM

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 07/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/028,955

Applicant(s)

BERNARDS ET AL.

Examiner

Shamim Ahmed

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## DETAILED ACTION

### *Response to Amendment*

1. The declaration filed on 5/2/05 under 37 CFR 1.131 has been considered but is ineffective to overcome the Nakagawa reference.
2. The evidence submitted is insufficient to establish a reduction to practice of the invention in this country or a NAFTA or WTO member country prior to the effective date of the Nakagawa reference. Applicants fail to provide the information that the reduction to practice of the invention has been done in this country or a NAFTA or WTO member country.

### *Response to Arguments*

3. Applicant's arguments filed 5/2/05 have been fully considered but they are not persuasive. Applicants argue that Bayes et al do not teach the particular combination of claimed invention particularly the combination of topography modifier and uniformity enhancer.

In response to the argument, examiner states that the argument is not persuasive because Bayes et al teach a process of roughening copper surface using an adhesion promoting composition including a sulfuric acid as claimed pH adjuster, hydrogen peroxide, and benzotriazole (so called 1-H benzotriazole which resembles a topography modifier (col.4, line 61-col.5, line 32 and examples 1-3 at col.7).

Bayes et al also teach that the adhesion promotion composition includes **one or more of a triazole, tetrazole**, wherein triazole and tetrazole resembles the claimed topography modifier and uniformity enhancer, respectively (col.5, lines 27-30).

Therefore, Bayes et al anticipate the use of both the topography modifier and uniformity enhancer in the adhesion promoting composition.

Accordingly, the rejections of the previous office action is repeated herein as follows:

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-3,12 and 21 are rejected under 35 U.S.C. 102(e) as anticipated by Bayes et al (6,054,061).

Bayes et al disclose a process for preparing roughened copper surface of a copper-clad laminate, wherein the copper surface is contacted with an adhesion promoting composition including a sulfuric acid as claimed pH adjuster, hydrogen peroxide, and benzotriazole (so called 1-H benzotriazole which resembles a topography modifier (col.4, line 61-col.5, line 32 and examples 1-3 at col.7).

Bayes et al also teach that the adhesion promotion composition includes one or more of a triazole, tetrazole, wherein triazole and tetrazole resembles the claimed topography modifier and uniformity enhancer, respectively (col.5, lines 27-30).

As to claims 2 and 21, Bayes et al teach that the copper surface is cleaned by chemical cleaning prior to contact with the adhesion promoter (col.6, lines 14-16).

As to claim 3, Bayes et al teach that the treated surface is rinsed (post-dip) followed by the adhesion promotion step (col.7, lines 12-15).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-3,10,12 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bayes et al (6,054,061) in view of Nakagawa et al (6,106,899).

Bayes et al discussed above in the paragraph 5 but may be do not explicitly teach that the composition includes a uniformity enhancer, wherein the uniformity enhancer is a derivative of tetrazole.

However, in a method of copper surface treatment, Nakagawa et al teach using a derivative of tetrazole such as 1-methyl aminotetrazole (so-called 5-methyl aminotetrazole), which resemble as the claimed uniformity enhancer along with a topography modifier (derivative of amonotetrazole) to improve the copper surface for adhesion for subsequent processing in the manufacturing of printed circuit board (col.1, lines 6-10,col.2, lines 2-3 and lines 6-18 and col. 3, lines col.3, lines 26-63 and Table 1, example 3).

Nakagawa et al also teach that the use of a mixture of derivatives of aminotetrazole and derivatives of aminotriazole enables the provision of copper surfaces with excellent thermal resistance and as well as moisture resistance (col.3, lines 32-34).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of claimed invention to combine the teaching of Nakagawa et al's teaching into Bayes et al's process for increasing the adhesion capability of the treated copper surface with excellent thermal resistance and as well as moisture resistance as taught by Nakagawa et al.

9. Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bayes et al (6,054,061) in view of Nakagawa et al (6,106,899) and further in view of Adlam et al (5,861,076).

Modified Bayes et al discussed in the paragraph 8 above but fail to teach contacting the uniform roughened copper surface with a post-dip solution comprising an azole or silane compound or a mixture thereof.

However, Adlam et al teach the use of coupling agents for improving the bonding of roughened copper surfaces to a resinous substrate. Suitable coupling agents include methacrylamide functional amines, and titanium and zirconium containing derivatives thereof (col.9, lines 15-44).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of claimed invention to use silane coupling composition as taught by Adlam et al following the treatment of the copper surface with the roughening composition of modified Bayes et al for providing a treated copper surface having improved adhesion characteristics.

10. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bayes et al (6,054,061) in view of Nakagawa et al (6,106,899) and Adlam et al (5,861,076) as applied to claims 4-8 above, and further in view of Noddin (5,910,255).

Modified Bayes et al discussed above in the paragraph 9 but fail to teach the post dipping solution comprises aluminate.

However, Noddin teach that the coupling agents may include silane, aluminate or zirconate (col.28, lines 47-55).

Therefore, it would have been obvious to combine the teaching of using either one of aluminate or zirconate or silane into modified Bayes et al's composition because both the aluminate and zirconate are functional equivalent as taught by Noddin.

11. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bayes et al (6,054,061) in view of Nakagawa et al (6,106,899) and further in view of Bishop et al (6,284,309).

Modified Bayes et al discussed in the paragraph 8 above but does not teach the inclusion of a copper salt in the roughening etchant composition.

However, Bishop et al teach a method for producing a copper surface with improved bonding by contacting the copper surface with a solution comprising an oxidizing agent, an acid, a copper complexing agent and a copper complex of copper salt, wherein the copper salt is present in an amount sufficient to precipitate copper from the solution for increasing the removal rate of copper (col.4, line 58-col.5, line 9).

Therefore, it would have been obvious to combine the teaching of using the copper complex of Bishop et al in to modified Bayes et al's process for providing an improved adhesion properties of the treated copper surface by increasing the removal rate as taught by Bishop et al.

### ***Conclusion***

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any



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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-1457. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shamim Ahmed  
Primary Examiner  
Art Unit 1765

SA  
July 18, 2005